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MACPHERSON KWOK CHEN & HEID LLP
2033 GATEWAY PLACE
SUITE 400
SAN JOSE, CA 95110

EXAMINER	
MOON, SEOKYUN	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/696,236	CREDELLE, THOMAS LLOYD	
	Examiner	Art Unit	
	SEOKYUN MOON	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 August 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) *6,7,22-24 and 27* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,8-21,25,26 and 28-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 March 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *03/19/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. The Applicant's arguments with respect to newly amended independent claims 1, 8, 13, 15, and 20 have been considered but are moot in view of the new ground(s) of rejection.

Remark

2. In this Office Action, objection to the specification of the instant Application is newly made. Accordingly, this Office Action is made Non-Final.

Specification

3. The disclosure is objected to because of the following matters:

The specification has failed to disclose or explain the cause of image degradation (disclosed in independent claims 1, 8, and 15) sufficiently enough for one of ordinary skill in the art to understand the instant invention. While newly added claim 30 discloses image degradation being caused by same color sub-pixels of same polarity (which is consistent with the Examiner's interpretation of the cause of the "image degradation", as disclosed in page 9 of the Office Action mailed on October 17, 2006), the Applicant's representatives, Moon Im, and Sarah Hwang, asserted that the image degradation is not just simply caused by sub-pixels having same color and same polarity, during the phone interview on November 07, 2007. In other words, the specification of the instant Application has failed to disclose the cause of image degradation that the Applicant intended to disclose. Furthermore, if image degradation is simply caused by sub-

pixels having same color and same polarity, then the previously-presented claims would be rejected based on the same rejections made in the Office Action mailed on October 17, 2007.

Appropriate explanation/correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. **Claims 13**, **14**, **20**, **21**, **25**, **26**, and **31** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

As to **claims 13**, **20**, **25**, and **26**, the claims disclose, "*parasitic effects placed upon any sub-pixels introduced by said signals are placed substantially upon the at least one column of blue sub-pixels*".

However, Examiner respectfully submits that the parasitic effects placed upon sub-pixels cannot be placed upon other sub-pixels. According to the specification of the instant Application, it appears that the condition for causing the image degradation or the parasitic effects is only satisfied when the sub-pixels are blue sub-pixels.

For further examination purpose, the claim limitation will be interpreted as, "*parasitic effects introduced by said signals are placed substantially upon the at least one column of blue sub-pixels*", as best understood by Examiner.

As to **claims 25** and **26**, the claims disclose, "*any parasitic effects*".

However, Examiner respectfully submits that it is not possible to place any parasitic effects on specific sub-pixels since some types of parasitic effects occur randomly, and thus such types of parasitic effects cannot be controlled to be placed on specific sub-pixels.

For further examination purpose, the claim limitation will be interpreted as, "*parasitic effects*", as best understood by Examiner.

As to **claim 14**, **21**, and **31**, the claims are rejected as being dependent upon base claims rejected under 35 U.S.C. 112, first paragraph.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. **Claims 1**, **2**, **5**, **8**, **9**, **12-16**, **19-21**, **25**, **26**, and **28-31** are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori (US 6,326,981).

As to **claim 1**, Mori teaches a liquid crystal display [abstract lines 1-2] comprising:

a panel [fig. 4, col. 4 lines 1-2, and drawing 1 provided on page 5 of this Office Action, which is equivalent to figure 15 of Mori] substantially comprising a sub-pixel repeating group (the group of eight sub-pixels within the rectangular box having white background) comprising an even number of sub-pixels in a row (having four sub-pixels in a row), the sub-pixel repeating

group further comprising a column of dark colored sub-pixels (the two blue sub-pixels included in the rectangular box having gray background); and

a driver circuit sending signals indicating image data to the panel [col. 1 lines 47-52 and col. 12 lines 12-17].

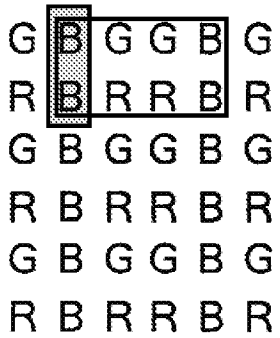


FIG. 15

Drawing 1

Mori does not expressly teach the driver circuit sending signals indicating image data having a polarity scheme to the panel.

However, Examiner takes Official Notice that it is well known in the art to apply signals indicating image data of which polarity is inverted every frame (i.e. image data having a frame inversion scheme) to the panel.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the driver circuit of Mori to send signals indicating image data having a frame inversion scheme to the panel, in order to correct the change on the arrangement of the liquid crystals of the display, caused by applying same polarity voltage to the liquid crystals for a long time period.

Mori as modified above inherently teaches image degradation introduced by the signals being localized on the column of dark colored sub-pixels since flickering or crosstalk caused by the frame inversion scheme would degrade the quality of the images to be displayed by all of sub-pixels and thus image degradation related to blue colors would be localized on the column of blue colored sub-pixels, which are dark colored sub-pixels.

As to **claim 2**, Mori teaches the dark colored sub-pixels being blue colored sub-pixels [drawing 1 provided on page 5 of this Office Action].

As to **claim 5**, Mori as modified above teaches one or more sub-pixels receiving a correction signal (Note that the signals indicating image data having a frame-inverted polarity would correct the change on the arrangement of the liquid crystals, caused by applying same polarity voltage to the liquid crystals for a long time period. And thus the signals indicating image data having an inverted polarity are signals correcting the change on the arrangement of liquid crystals).

As to **claim 8**, Mori teaches a method of driving liquid crystal displays [abstract lines 1-2], comprising:

arranging sub-pixels in a sub-pixel repeating group (the group of eight sub-pixels within the rectangular box having white background) [drawing 1 provided on page 5 of this Office Action] of a panel [fig. 4 and col. 4 lines 1-2] comprising an even number of sub-pixels (having four sub-pixels in a row) in a row, the sub-pixel repeating group further comprising a column of dark colored sub-pixels (the two blue sub-pixels included in the rectangular box having gray background); and

providing driver signals to the sub-pixels in the panel to send image data.

Mori does not expressly teach the method comprising providing driver signals to the sub-pixels in the panel to send image data having a polarity scheme.

However, Examiner takes Official Notice that it is well known in the art to apply driver signals to sub-pixels of a liquid crystal display to send image data of which polarity is inverted every frame (i.e. image data having a frame inversion scheme).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mori to provide driver signals to the sub-pixels in the panel to send image data having a frame inversion scheme, in order to correct the change on the arrangement of the liquid crystals of the display, caused by applying same polarity voltage to the liquid crystals for a long time period.

Mori as modified above inherently teaches image degradation introduced by the signals being localized on the column of dark colored sub-pixels since flickering or crosstalk caused by the frame inversion scheme would degrade the quality of the images to be displayed by all of sub-pixels and thus image degradation related to blue colors would be localized on the column of blue colored sub-pixels, which are dark colored sub-pixels.

As to **claim 9**, Mori teaches the column of dark colored sub-pixels being the column of blue sub-pixels [drawing 1 provided on page 5 of this Office Action].

As to **claim 12**, Mori as modified above teaches the method comprising providing correction signals to one or more sub-pixels in the group of sub-pixels (Note that the driver signals used to send image data having a frame-inverted polarity would correct the change on the arrangement of the liquid crystals, caused by applying same polarity voltage to the liquid crystals

for a long time period. And thus the driver signals used to send image data having an inverted polarity are signals correcting the change on the arrangement of liquid crystals).

As to **claim 13**, Mori teaches a method of driving liquid crystal displays [abstract lines 1-2], comprising:

arranging sub-pixels into at lease one sub-pixel repeating group (the group of eight sub-pixels within the rectangular box having white background) [drawing 1 provided on page 5 of this Office Action] in a panel [fig. 4 and col. 4 lines 1-2], the sub-pixel repeating group comprising an even number of sub-pixels (having four sub-pixels in a row) in a row and at least one column of blue sub-pixels (the two blue sub-pixels included in the rectangular box having gray background); and

providing signals for image data to the panel with a driver circuit [col. 1 lines 47-52 and col. 12 lines 12-17].

Mori does not expressly teach the method comprising providing signals for image data having a polarity scheme to the panel with a driver circuit having at least two phases.

However, Examiner takes Official Notice that it is well known in the art to provide signals for image data having a frame inversion scheme to a panel of a liquid crystal display with a driver circuit having at least two phases (+ or -).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mori to provide signals for image data having a frame inversion scheme to a panel of a liquid crystal display with a driver circuit having at least two phases, in order to correct the change on the arrangement of the liquid crystals of the display, caused by applying same polarity voltage to the liquid crystals for a long time period.

Mori as modified above inherently teaches parasitic effects introduced by the signals being placed substantially upon the column of blue sub-pixels since the parasitic capacitance developed by the frame inversion scheme would degrade the quality of the images to be displayed by all of sub-pixels and thus parasitic capacitance related to blue colors would be placed on the column of blue sub-pixels.

As to **claim 15**, Mori teaches a liquid crystal display [abstract lines 1-2] comprising:

a display panel [fig. 4, col. 4 lines 1-2, and drawing 1 provided on page 5 of this Office Action] including a plurality of sub-pixels arranged in a sub-pixel repeating group (the group of eight sub-pixels within the rectangular box having white background), the sub-pixel repeating group comprising an even number of sub-pixels in a row (having four sub-pixels in a row), and including a column of dark colored sub-pixels (the two blue sub-pixels included in the rectangular box having gray background); and

means [col. 1 lines 47-52 and col. 12 lines 12-17] for providing driver signals to the sub-pixels in the display panel to send image data.

Mori does not expressly teach the means for providing driver signals to the sub-pixels in the display panel to send image data having a polarity scheme.

However, Examiner takes Official Notice that it is well known in the art to apply driver signals to sub-pixels of a liquid crystal display to send image data of which polarity is inverted every frame (i.e. image data having a frame inversion scheme).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the means for providing driver signals to send image data having a frame inversion scheme to the panel, in order to correct the change on the arrangement of the liquid

crystals of the display, caused by applying same polarity voltage to the liquid crystals for a long time period.

Mori as modified above inherently teaches image degradation introduced by the signals being localized on the column of dark colored sub-pixels since flickering or crosstalk caused by the frame inversion scheme would degrade the quality of the images to be displayed by all of sub-pixels and thus image degradation related to blue colors would be localized on the column of blue colored sub-pixels, which are dark colored sub-pixels.

As to **claim 14**, Mori as modified above teaches the method comprising providing a correction signal to one or more sub-pixels (Note that the driver signals used to send image data having a frame-inverted polarity would correct the change on the arrangement of the liquid crystals, caused by applying same polarity voltage to the liquid crystals for a long time period. And thus the driver signals used to send image data having an inverted polarity are signals correcting the change on the arrangement of liquid crystals).

As to **claim 16**, Mori teaches the column of dark colored sub-pixels being the column of blue sub-pixels [drawing 1 provided on page 5 of this Office Action].

As to **claim 19**, Mori as modified above teaches the liquid crystal display further comprising means for providing correction signals to one or more sub-pixels in the group of sub-pixels (Note that the driver signals used to send image data having a frame-inverted polarity would correct the change on the arrangement of the liquid crystals, caused by applying same polarity voltage to the liquid crystals for a long time period. And thus the driver signals used to send image data having an inverted polarity are signals correcting the change on the arrangement of liquid crystals).

As to **claim 20**, Mori teaches a liquid crystal display [abstract lines 1-2], comprising:

display means including a plurality of sub-pixels arranged in at least one sub-pixel repeating group (the group of eight sub-pixels within the rectangular box having white background) [drawing 1 provided on page 5 of this Office Action], the sub-pixel repeating group comprising an even number of sub-pixels in a row (having four sub-pixels in a row) and including at least one column of blue sub-pixels (the two blue sub-pixels included in the rectangular box having gray background); and

driving means [col. 1 lines 47-52 and col. 12 lines 12-17] for providing signals for image data to the display means.

Mori does not expressly teach the driving means for providing signals for image data having a polarity scheme to the display means, wherein the driving means has at least two phases.

However, Examiner takes Official Notice that it is well known in the art to provide signals for image data having a frame inversion scheme to a display means of a liquid crystal display, wherein the driver of the liquid crystal display has two phases (+ or -).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the driving means to provide signals for image data having a frame inversion scheme having two phases to the display means, in order to correct the change on the arrangement of the liquid crystals of the display, caused by applying same polarity voltage to the liquid crystals for a long time period.

Mori as modified above inherently teaches parasitic capacitance caused by the signals being placed on the column of blue sub-pixels since the parasitic capacitance caused by the

frame inversion scheme would degrade the quality of the images to be displayed by all of sub-pixels and thus image degradation related to blue colors would be localized on the column of blue colored sub-pixels, which are dark colored sub-pixels.

As to **claim 21**, Mori as modified above teaches the display further comprising a means for providing a correction signal to one or more sub-pixels (Note that the driver signals used to send image data having a frame-inverted polarity would correct the change on the arrangement of the liquid crystals, caused by applying same polarity voltage to the liquid crystals for a long time period. And thus the driver signals used to send image data having an inverted polarity are signals correcting the change on the arrangement of liquid crystals).

As to **claim 25**, Mori as modified above teaches the driver circuit (Mori: "*106*") [Mori: fig. 25] comprising a plurality of two-phases driver chips [Mori: col. 12 lines 15-16] (Note that the driver chips of Mori are modified to have two phases, as discussed with respect to the rejection of claim 13), wherein phases of each driver chip are selected such that parasitic effects introduced by the signals are placed substantially upon sub-pixels disposed in columns positioned at a boundary between the driver chips (Note that the parasitic effects, i.e. variations on the parasitic capacitances, caused by the signals having a frame polarity inversion scheme are placed upon all sub-pixels disposed on the panel of the liquid crystal display).

As to **claim 26**, Mori as modified above teaches the driving means (Mori: "*106*") [Mori: fig. 25] including a plurality of two-phase driver chips [Mori: col. 12 lines 15-16] (Note that the driver chips of Mori are modified to have two phases, as discussed with respect to the rejection of claim 20) for providing signals for the image data having the polarity scheme to the display means, wherein the phases of each driver chip is selected such that parasitic effects introduced by

the signals are placed substantially upon blue sub-pixels disposed in columns positioned at a boundary between the driver chips (Note that the parasitic effects, i.e. variations on the parasitic capacitances, caused by the signals having a frame polarity inversion scheme are placed upon all sub-pixels disposed on the panel of the liquid crystal display).

As to **claim 29**, Mori as modified above teaches that the means (Mori: "*106*") [Mori: fig. 25] for providing driver signals includes a plurality of two-phase driver chips [Mori: col. 12 lines 15-16] (Note that the driver chips of Mori are modified to have two phases, as discussed with respect to the rejection of claim 15) for sending the driver signals to the display panel, wherein the phases of each driver chip is selected such that parasitic effects introduced by driver signals are placed substantially upon blue sub-pixels disposed in columns positioned at a boundary between the driver chips (Note that the parasitic effects, i.e. variations on the parasitic capacitances, caused by the signals having a frame polarity inversion scheme are placed upon all sub-pixels disposed on the panel of the liquid crystal display).

As to **claim 28**, Mori as modified above teaches that the driver circuit sends signals indicating image data having a polarity scheme to the panel such that at least two adjacent sub-pixels in a row have the same polarity (Note that, in the panel driven with a frame inversion scheme, all of the sub-pixels have a same polarity at the same time).

As to **claim 30**, Mori as modified above teaches the image degradation being caused by same color sub-pixels of same polarity (Note that the image degradation by a frame inversion scheme is caused by having same color sub-pixels of same polarity at the same time).

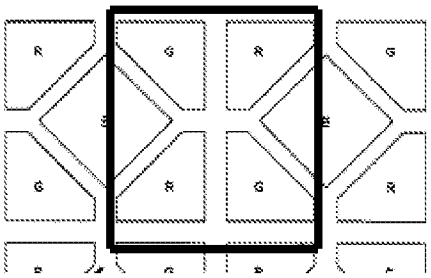
As to **claim 31**, Mori as modified above teaches parasitic effects being parasitic capacitances (as discussed with respect to the rejection of claim 13).

8. **Claims 3**, **4**, **10**, **11**, **17**, and **18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori as applied to claims 1, 2, 5, 8, 9, 12-16, 19-21, 25, 26, and 28-31 above, and further in view of Martin (US 6,714,206).

As to **claim 3**, Mori [drawing 1 provided on page 5 of this Office Action] teaches the sub-pixel repeating group (the sub-pixels included in the rectangular box drawn with solid lines) substantially comprising red and green sub-pixels interspersed with two columns of blue sub-pixels.

Mori does not expressly disclose a checkerboard of red and green sub-pixels interspersed with two columns of blue sub-pixels.

However, Martin [drawing 2 provided below, which is equivalent to Martin's fig. 2] teaches an arrangement of placing four sub-pixels (the sub-pixels included in the rectangle drawn with solid lines) having two different colors in a checkerboard pattern so that the two sub-pixels having a same color are not adjacent to each other in a horizontal direction and in a vertical direction.



Drawing 2

It would have been obvious to one of ordinary skill in the art at the time of the invention to adopt Martin's red and green sub-pixel arrangement in the modified Mori's display, in order to provide an uniform color illumination for a liquid crystal display by placing the four adjacent

sub-pixels having two different colors in a pattern such that the two sub-pixels having a same color are not adjacent to each other in a horizontal direction and in a vertical direction.

As to **claim 4**, Mori [fig. 25] teaches the two columns of blue sub-pixels share a same column driver ("*source driver 106*").

As to **claim 10**, all of the claim limitations have already been discussed with respect to the rejection of claim 3.

As to **claim 11**, all of the claim limitations have already been discussed with respect to the rejection of claims 4 and 8.

As to **claim 17**, all of the claim limitations have already been discussed with respect to the rejection of claim 3.

As to **claim 18**, all of the claim limitations have already been discussed with respect to the rejection of claim 11.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SEOKYUN MOON whose telephone number is (571)272-5552. The examiner can normally be reached on Mon - Fri (8:30 a.m. - 5:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

December 30, 2008
/S. M./
Examiner, Art Unit 2629

/Sumati Lefkowitz/
Supervisory Patent Examiner, Art Unit 2629